OCCUPATIONAL ANALYSES SERIES

Roofer

2006

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Occupational Analyses Series

Roofer

2006

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The Canadian Council of Directors of Apprenticeship (CCDA) recognizes this occupational analysis as the national standard for the occupation of Roofer.

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LIST OF PUBLISHED OCCUPATIONAL ANALYSES

TITLE	NOC* Code
Appliance Service Technician (2005)	7332
Automotive Painter (2005)	7322
Automotive Service Technician (2005)	7321
Baker (1997)	6252
Boilermaker (2003)	7262
Bricklayer (2000)	7281
Cabinetmaker (2000)	7272
Carpenter (2005)	7271
Concrete Finisher (2006)	7282
Construction Electrician (2003)	7241
Cook (2003)	6242
Electrical Rewind Mechanic (1999)	7333
Electronics Technician – Consumer Products (1997)	2242
Farm Equipment Mechanic (2000)	7312
Floorcovering Installer (2005)	7295
Glazier (2004)	7292
Hairstylist (2005)	6271
Heavy Duty Equipment Technician (2004)	7312
Industrial Electrician (2003)	7242
Industrial Instrument Mechanic (2000)	2243
Industrial Mechanic (Millwright) (1999)	7311
Insulator (Heat and Frost) (2000)	7293
Ironworker (Generalist) (1993)	7264
Lather (Interior Systems Mechanic) (2002)	7284
Machinist (2005)	7231
Metal Fabricator (Fitter) (2003)	7263

Mobile Crane Operator (2006)	7371
Motorcycle Mechanic (1995)	7334
Motor Vehicle Body Repairer (Metal and Paint) (2005)	7322
Oil Burner Mechanic (1997)	7331
Painter and Decorator (2000)	7294
Partsperson (2005)	1472
Plumber (2003)	7251
Powerline Technician (2004)	7244
Recreation Vehicle Mechanic (2000)	7383
Refrigeration and Air Conditioning Mechanic (2004)	7313
Roofer (2006)	7291
Sheet Metal Worker (1997)	7261
Sprinkler System Installer (2003)	7252
Steamfitter -- Pipefitter (1996)	7252
Tilesetter (2004)	7283
Tool and Die Maker (2005)	7232
Transport Trailer Technician (2003)	7321
Truck and Transport Mechanic (2000)	7321
Welder (2004)	7265

* National Occupational Classification

Requests for these publications should be forwarded to:

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Human Resources Partnerships
Human Resources and Skills Development Canada
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Gatineau, Quebec K1A 0J9

These publications are also available to order or download online at: **www.red-seal.ca**.

A comparative listing of apprenticeship training programs across Canada may be accessed at **www.ellischart.ca**. The Ellis Chart also lists the current provincial and territorial trade names.

FOREWORD

The first National Conference on Apprenticeship in Trades and Industries, held in Ottawa in 1952, recommended that the federal government be requested to co-operate with provincial and territorial apprenticeship committees and officials in preparing analyses of a number of skilled occupations. To this end, Human Resources and Skills Development Canada (HRSDC) sponsors a program, under the guidance of the Canadian Council of Directors of Apprenticeship (CCDA), to develop a series of occupational analyses.

The Occupational Analysis Program has the following objectives:

- to identify and group the tasks performed by skilled workers in particular occupations;
- to identify those tasks that are performed by skilled workers in every province and territory;
- to develop instruments for use in the preparation of Interprovincial Standards "Red Seal" Examinations and curricula for training leading to the certification of skilled workers;
- to facilitate the mobility, in Canada, of apprentices and skilled workers;
- to supply employers and employees, and their associations, industries, training institutions and governments with analyses of the tasks performed in particular occupations.

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GUIDE TO ANALYSIS

DEVELOPMENT OF ANALYSIS

A draft analysis is developed by a committee of industry experts in the field led by a team of facilitators. This draft analysis identifies all the tasks performed in the occupation.

The draft is translated and reviewed by the NOA Team of HRSDC. A copy of this analysis is then forwarded to provincial/territorial authorities for review by specialists in the field. Their recommendations are assessed and incorporated into the final draft.

The occupational analysis is published in both official languages.

STRUCTURE OF ANALYSIS

To facilitate understanding of the nature of the occupation, the work performed is divided into the following divisions:

BLOCK – is the largest division within the analysis and reflects a distinct operation relevant to the occupation.

TASK – is the distinct activity that, combined with others, makes up the logical and necessary steps the worker is required to perform to complete a specific assignment within a "BLOCK".

SUB-TASK – is the smallest division into which it is practical to subdivide any work activity and, combined with others, fully describes all duties constituting a "TASK".

Supporting Knowledge & Abilities

The elements of skill and knowledge that an individual must acquire to adequately perform the sub-task.

Trends

Any shifts or changes in technology that affect the block.

Related Components

All components related to a specified block being undertaken by roofers.

Tools and Equipment

All tools and equipment necessary for roofers to perform the work on all given tasks identified within the block.

Context

A statement written to clarify the intent and meaning of tasks in the analysis.

VALIDATION METHOD

At the request of the Canadian Council of Directors of Apprenticeship (CCDA), the Standardization Sub-committee developed a method for validating the Red Seal National Occupational Analyses.

A draft of the analysis is sent to all jurisdictions for validation. Each jurisdiction rates the sub-tasks and applies percentage ratings to blocks and tasks. This method for the validation of the National Occupational Analysis identifies common core tasks across Canada for a specific occupation. This feature facilitates the weighting of the Interprovincial Standards "Red Seal" Examinations.

DEFINITIONS

YES: the sub-task is performed by workers in the occupation in a specific jurisdiction.

NO: the sub-task is not performed by workers in the occupation in a specific jurisdiction.

BLOCK %: the average number of questions (items), derived from the collective decision made by workers within the occupation from all areas of Canada, that will be placed on an interprovincial examination to assess each block of the analysis.

TASK %: the average number of questions (items), derived from the collective decision made by workers within the occupation from all areas of Canada, that will be placed on an interprovincial examination to assess each task of the analysis.

NV: Not Validated by a province/territory.

ND: Not Designated in a province/territory.

PROVINCIAL/TERRITORIAL ABBREVIATIONS

NL: Newfoundland and Labrador
NS: Nova Scotia
PE: Prince Edward Island
NB: New Brunswick
QC: Quebec
ON: Ontario
MB: Manitoba
SK: Saskatchewan
AB: Alberta
BC: British Columbia
NT: Northwest Territories
YT: Yukon
NU: Nunavut

COMMON CORE

The criteria for determining common core depend on the performance of sub-tasks. If at least 70% of the responding jurisdictions (excluding NVs and NDs) perform a sub-task, it shall be considered common core.

Interprovincial Standards "Red Seal" Examinations are based on the common core identified through this validation process. Validation identifies what will be assessed through the interprovincial examination.

BLOCK AND TASK WEIGHTING (APPENDIX D)

This appendix represents the block and task percentages as submitted by each jurisdiction.

Each jurisdiction, with the use of a provincial/territorial occupational advisory committee, validates the content, places percentages on blocks and tasks, and indicates whether or not the sub-tasks are performed by the skilled workers within the occupation. The results of this exercise are submitted to the NOA Team who then analyzes the data and develops this appendix which provides the individual jurisdictional validation results as well as the national averages of all responses.

PIE CHART (APPENDIX E)

The graph depicts the national percentages assigned to blocks in the analysis.

SCOPE OF THE ROOFER OCCUPATION

Roofers install, repair and replace flat and sloped roofs. They work with membrane roofing systems that consist of a variety of materials with different application methods. They also install, replace and repair shingles, slate, shakes, roofing tiles, sheet metal and other preformed sheeting on sloped roofs.

Before the work begins, roofers may inspect existing roof systems and determine the extent and procedure for repair of the substrate or removal and replacement of roofing materials. Some roofers may be involved in the estimating of material and installation costs.

As part of the job preparation, roofers may set up scaffolding and fall restraint systems to provide safe access to the work area. They also weatherproof, waterproof and damp-proof roofing surfaces, foundation walls, floor slabs and bridge decks. They install roofing accessories such as sheet metal flashings, roof vent flashings, anchor bolt flashings, drain inserts and clamps.

Roofers may be employed by roofing companies, general contractors or they may be self-employed. They may work on all types of roofs or may specialize in the flat or slightly sloping roofs of commercial and industrial buildings or in the sloped roofs found in most residential buildings.

Key attributes for people in this trade are mechanical aptitude, manual dexterity and the ability to work in a team. Roofers work primarily outdoors and work may be seasonal. The work environment may vary from cold to extremely hot, working in the sun with molten bitumen and torches. Roofing is physically demanding work and requires considerable effort in lifting, climbing, bending, kneeling and balancing on high, sloped and sometimes slippery surfaces.

Roofers work in conjunction with other tradespeople in the construction trades. With additional training, roofers may transfer their skills to related occupations such as carpenter and sheet metal worker. With experience, they may advance to supervisory positions or become contractors or inspectors.

OCCUPATIONAL OBSERVATIONS

There is an increased emphasis on the use of fall arrest and restraint equipment to ensure worker safety. The use of personal protective equipment (PPE) such as respirators and hand and eye protection is becoming more important. Employees are often required to participate in the development and implementation of safety procedures and company policies.

Due to the concern over fires, more emphasis is being placed on training on the use of open flame. Roofers are using mechanically fastened and peel-and-stick membranes. There is an increase in concern about chemical fumes entering buildings. This has resulted in more communication with owners, contractors and tenants.

Refuse material is often required to be separated and recycled especially with regard to asbestos, metals and other materials generated by roofer trade projects.

Roofers are using more automated equipment to move materials and install roofing systems.

Increasing numbers of roof projections mean that roofers spend more time detailing and accommodating these features.

There is also an urban trend towards producing more decorative roofs, ensuring that architectural design and structure, as well as membranes, panels and siding match. There is an increase in demand for "Green Roofing" due to the cooling effects realized and to the environmental benefits.

SAFETY

Safe working procedures and conditions, accident prevention and the preservation of health are of primary importance to industry in Canada. These responsibilities are shared and require the joint efforts of government, employers and employees. It is imperative that all parties are aware of circumstances and conditions that may lead to injury or harm. Safe learning experiences and environments can be created by controlling the variables and behaviours that may contribute to accidents or injury.

It is generally recognized that a safety-conscious attitude and work practices contribute to a healthy, safe and accident-free working environment.

It is imperative to apply and be familiar with the Occupational Health and Safety Acts and Workplace Hazardous Material Information System (WHMIS) Regulations. As well, it is essential to determine workplace hazards and take measures to protect oneself, co-workers, the public and the environment.

As safety education is an integral part of training in all jurisdictions, personal safety practices are not recorded in this document. However, the technical safety aspect relating to each task and sub-task are included throughout this analysis.

ANALYSIS

BLOCK A

OCCUPATIONAL SKILLS

Trends: *New tools and equipment have been introduced to make roofers' tasks easier. There are more cordless tools available to roofers. Torch safety regulations are being emphasized more. Safety equipment and PPE is being used more consistently by roofers. Worksite and public safety has become more important. Use of documentation by roofers has increased in order to demonstrate due diligence and compliance with regulations.*

Related Components: All roofing components.

Tools and Equipment: See Appendix A.

Task 1 **Uses tools and equipment.**

Context: *Proper tool and equipment procedures result in a more efficient and safe job site with less physical fatigue to roofers.*

Sub-task

1.01 **Uses hand tools.**

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

1.01.01	knowledge of types of roofing hand tools such as measuring tools, cutting tools, ripping tools, fastening tools and application tools
1.01.02	ability to select hand tools for specific job
1.01.03	ability to maintain hand tools
1.01.04	ability to store hand tools
1.01.05	ability to recognize worn, damaged and defective hand tools

Sub-task

1.02 Uses power tools.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

1.02.01	knowledge of types of power tools such as cutting tools, cleaning tools and fastening tools
1.02.02	ability to select power tools for specific job
1.02.03	ability to maintain power tools
1.02.04	ability to store power tools
1.02.05	ability to recognize worn, damaged and defective power tools

Sub-task

1.03 Uses pneumatic tools.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

1.03.01	knowledge of types of pneumatic tools such as caulking guns, nailers, staplers and sprayers
1.03.02	ability to select pneumatic tools for specific job
1.03.03	ability to maintain pneumatic tools
1.03.04	ability to store pneumatic tools
1.03.05	ability to recognize worn, damaged and defective pneumatic tools

Sub-task

1.04 Uses powder actuated tools.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	no	yes	yes	NV	yes	NV

Supporting Knowledge & Abilities

1.04.01	knowledge of types of powder actuated tools such as hammer and gun
1.04.02	knowledge of certification requirements
1.04.03	knowledge of fastening techniques
1.04.04	ability to select shots for specific application
1.04.05	ability to select fasteners for specific application
1.04.06	ability to maintain powder actuated tools
1.04.07	ability to store powder actuated tools
1.04.08	ability to recognize worn, damaged and defective powder actuated tools

Sub-task

1.05 Uses propane-fuelled equipment.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

Supporting Knowledge & Abilities

1.05.01	knowledge of types of burners such as torches and kettles
1.05.02	knowledge of types of propane bottles such as liquid and vapour
1.05.03	knowledge of certification requirements
1.05.04	knowledge of handling procedures
1.05.05	knowledge of transportation procedures and regulations for propane cylinders

1.05.06	ability to connect and disconnect propane-fuelled equipment
1.05.07	ability to inspect propane lines, valves, couplers and regulators
1.05.08	ability to maintain propane-fuelled equipment
1.05.09	ability to store propane-fuelled equipment
1.05.10	ability to recognize worn, damaged and defective propane-fuelled equipment

Sub-task

1.06 Uses hot process equipment. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

1.06.01	knowledge of types of hot process equipment such as heating, application and bitumen equipment
1.06.02	knowledge of equiviscous temperatures (EVT) and flashpoint temperatures
1.06.03	ability to handle hot process equipment
1.06.04	ability to connect and disconnect hot process equipment to fuel source
1.06.05	ability to check for moisture
1.06.06	ability to keep hot bitumen clean
1.06.07	ability to fire up kettles, tankers and torches
1.06.08	ability to fill kettles and tankers
1.06.09	ability to maintain bitumen temperature
1.06.10	ability to connect, brace and disconnect piping for asphalt
1.06.11	ability to maintain hot process equipment

1.06.12	ability to store hot process equipment
1.06.13	ability to recognize worn, damaged and defective hot process equipment

Sub-task

1.07 Uses hoisting, lifting and rigging equipment.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

1.07.01	knowledge of types of hoists such as A-frame hoist, monorail, hand hoist, ladder hoist and hydraulic hoist
1.07.02	knowledge of rigging such as slings, cables, hooks, shackles and spreader bars
1.07.03	knowledge of safe work practices for hoisting, lifting and rigging
1.07.04	knowledge of counterweights for hoists
1.07.05	knowledge of regulations for hoisting
1.07.06	knowledge of manufacturers' specifications
1.07.07	knowledge of training and certification requirements
1.07.08	knowledge of operating procedures
1.07.09	knowledge of rated loads of slings, cables, hooks and shackles
1.07.10	knowledge of weight distribution when rigging and lifting
1.07.11	ability to inspect components such as hoist frames, motors, connections, cables, hooks, shackles and spreader bars
1.07.12	ability to protect roof membrane and substrate from counterweights and frame

1.07.13	ability to maintain hoisting, lifting and rigging equipment
1.07.14	ability to secure loads
1.07.15	ability to use hand signals for cranes
1.07.16	ability to recognize worn, damaged and defective hoisting, lifting and rigging equipment
1.07.17	ability to operate radio communication devices for signalling purposes

Sub-task

1.08 Uses motorized equipment. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

1.08.01	knowledge of types of motorized equipment related to roofing such as power buggies, roof cutters, asphalt spreaders and gravel spreaders
1.08.02	knowledge of manufacturers' specifications and requirements
1.08.03	knowledge of small engine maintenance and minor repair
1.08.04	knowledge of operating procedures
1.08.05	ability to select motorized equipment for specific job
1.08.06	ability to store motorized equipment
1.08.07	ability to recognize worn, damaged and defective motorized equipment

Sub-task

1.09 Uses personal protective equipment (PPE) and safety equipment.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

Supporting Knowledge & Abilities

1.09.01	knowledge of types of PPE such as harnesses, respirators, eye protection, safety boots, gloves and hearing protection
1.09.02	knowledge of safety equipment such as warning lines, guard rails, fire extinguishers and first aid kits
1.09.03	knowledge of operating procedures for PPE and safety equipment
1.09.04	knowledge of company safety policies
1.09.05	knowledge of safety regulations and legislation
1.09.06	knowledge of training and certification requirements
1.09.07	ability to select PPE for specific job
1.09.08	ability to select and operate fire extinguishers and related fire safety equipment
1.09.09	ability to install safety equipment
1.09.10	ability to maintain PPE and safety equipment
1.09.11	ability to store PPE and safety equipment
1.09.12	ability to recognize worn, damaged and defective PPE and safety equipment

Task 2 Organizes work.

Context: Roofers' duties in communication, documentation and safety are very important. Well-organized jobs will ensure a productive and safe workplace for employees and the public.

Sub-task

2.01 Uses documentation.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

2.01.01	knowledge of regulations for specific jurisdictions
2.01.02	knowledge of company documentation such as safety manuals and policies
2.01.03	knowledge of Workplace Hazardous Materials Information System (WHMIS) documentation
2.01.04	knowledge of documentation requirements for hazardous goods such as mould and asbestos
2.01.05	knowledge of due diligence in health and safety issues
2.01.06	ability to read blueprints, architects' specifications, manuals and shop drawings
2.01.07	ability to read work orders
2.01.08	ability to interpret manufacturers' product specifications
2.01.09	ability to provide written inspection and maintenance reports

Sub-task

2.02 Communicates with others.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

2.02.01	ability to use hand signals

2.02.02	ability to operate communication equipment such as two-way radios and cell phones
2.02.03	ability to communicate with supervisor
2.02.04	ability to communicate with work crew
2.02.05	ability to communicate with design team such as architects, engineers and inspectors
2.02.06	ability to communicate with related tradespeople such as plumbers, electricians, carpenters, sheet metal workers and ironworkers
2.02.07	ability to communicate with customers
2.02.08	ability to coach apprentices
2.02.09	ability to notify occupants of temporary equipment shutdown, precautions taken and effects of operations such as noise, fumes and dust
2.02.10	ability to communicate with the general public
2.02.11	ability to communicate with manufacturers' technical personnel

Sub-task

2.03 Assesses worksite conditions. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

2.03.01	knowledge of starting and finishing points of work
2.03.02	knowledge of adequate curb and parapet height
2.03.03	knowledge of job equipment requirements such as disposal chutes and emission control kettles

2.03.04	ability to assess fall protection requirements
2.03.05	ability to assess type of deck
2.03.06	ability to assess problem areas on roof that may interfere with production and safety such as mechanical utilities, windows and skylights
2.03.07	ability to identify hazards
2.03.08	ability to determine access and egress requirements
2.03.09	ability to identify onsite utilities such as water and electrical outlets

Sub-task

2.04 Estimates materials.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

2.04.01	knowledge of types of materials such as membranes, felt, insulation, shingles, panels and fasteners
2.04.02	knowledge of coverage rates of roofing materials
2.04.03	ability to measure dimensions such as area, length and volume
2.04.04	ability to minimize material waste
2.04.05	ability to perform basic mathematical calculations
2.04.06	ability to convert metric and imperial measurements

Sub-task

2.05 Maintains safe work environment.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

Supporting Knowledge & Abilities

2.05.01	knowledge of workplace health and safety regulations
2.05.02	knowledge of safety equipment such as guard rails, safety fences and walkways for public
2.05.03	knowledge of company safety policies
2.05.04	knowledge of WHMIS
2.05.05	knowledge of safe work practices and procedures for material handling
2.05.06	knowledge of training and certification requirements
2.05.07	ability to identify hazards in order to protect work crew, property and the public
2.05.08	ability to access Material Safety Data Sheets (MSDS), first aid kits and emergency services

Task 3 Prepares work site.

Context: Roofers prepare their work site in order to ensure worker and public safety and to ensure that the work is done efficiently. The setup of equipment and material is done before the roofing process starts.

Sub-task

3.01 Accesses work area.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

3.01.01	knowledge of types of access equipment such as ladders, scaffolding, scissor lifts and man-lifts
3.01.02	knowledge of certification requirements for the operation or erection of access equipment
3.01.03	knowledge of regulations for the use of access equipment
3.01.04	knowledge of regulations related to fall arrest and restraint
3.01.05	ability to ensure solid footing for access equipment
3.01.06	ability to assemble scaffolding
3.01.07	ability to erect equipment such as ladders and scaffolding
3.01.08	ability to level scaffolding, scissor lifts and man-lifts
3.01.09	ability to secure access equipment to building
3.01.10	ability to recognize worn, damaged and defective access equipment

Sub-task

3.02 Positions equipment and material on the ground.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

3.02.01	knowledge of where to position equipment such as kettles, propane tanks and disposal bins
3.02.02	knowledge of regulations regarding the placement of propane tanks and kettles
3.02.03	ability to position safety equipment such as water hoses, fire extinguishers, safety cones, caution tape and safety fence
3.02.04	ability to communicate with the owner, the contractor and other tradespeople regarding placement of equipment and material

Sub-task

3.03 Positions equipment and material on the roof.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

3.03.01	knowledge of where to position equipment such as hoist, roof cutter and mini mop
3.03.02	knowledge of sequence of installation of materials
3.03.03	ability to position equipment and material taking into consideration weight distribution, safety, securement, windows, ventilation openings and ease of access
3.03.04	ability to secure propane tanks on the roof and while hoisting

3.03.05	ability to position safety equipment such as water hoses and fire extinguishers
3.03.06	ability to communicate with the owner, the contractor and other tradespeople regarding placement of equipment and material

Sub-task

3.04 Prepares material disposal systems.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

3.04.01	knowledge of components of material disposal systems such as wheelbarrows, garbage bags, chutes and disposal bins
3.04.02	knowledge of regulations regarding separation of materials such as metal and gravel
3.04.03	ability to erect and disassemble chutes and counterweights
3.04.04	ability to dispose of material using hoist

BLOCK B

ROOF PREPARATION

Trends: *There is an increase in the use of backpack blowers to remove water or debris from decks. More roofs are being vacuumed by other companies prior to roofers arriving to facilitate the removal of debris and to protect the environment. There is an increase in recovery of existing roof components instead of entire replacement. There is an increased demand to sort materials for recycling and reuse. New technologies have been developed to assess condition of the roof.*

Related Components: Primers, cleaners, gasoline, adhesives, propane, rust inhibiting paint, sealants, caulking, nails, screws, plates.

Tools and Equipment: Hand tools, power tools, pneumatic tools, powder actuated tools, propane-fuelled equipment, motorized equipment, PPE and safety equipment, material disposal equipment.

Task 4 **Prepares roof for replacement.**

Context: *Roofers prepare a specific area of the roof to facilitate the removal of the existing roof system and to ensure the replacement system can be installed efficiently.*

Sub-task

4.01 **Removes loose debris.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

Supporting Knowledge & Abilities

4.01.01	knowledge of types of debris such as vegetation, gravel and construction materials
4.01.02	knowledge of hazardous materials such as asbestos materials, mould, droppings, coal tar pitch and used needles
4.01.03	knowledge of company safety policies
4.01.04	ability to gather, store and dispose of debris
4.01.05	ability to notify authorities of hazardous materials

Sub-task

4.02 Protects windows, walls, skylights and mechanical equipment.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

Supporting Knowledge & Abilities

4.02.01	knowledge of types of protection material such as tarps, plywood, blankets and fabric
4.02.02	knowledge of damage such as broken glass, fume infiltration, staining and fire
4.02.03	ability to identify areas of potential damage
4.02.04	ability to identify areas of previous damage
4.02.05	ability to erect barriers to protect areas of non-operation
4.02.06	ability to place equipment and materials to prevent damage to windows, walls, skylights mechanical equipment and vehicles

Sub-task

4.03 Removes roofing and flashings.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

Supporting Knowledge & Abilities

4.03.01	knowledge of types of roof systems and their components
4.03.02	knowledge of weather conditions preventing removal of roof coverings
4.03.03	knowledge of sequence of roof removal
4.03.04	knowledge of potential hazards such as rotten deck, nails and electric wiring
4.03.05	knowledge of recyclable materials

4.03.06	knowledge of regulated and hazardous materials
4.03.07	ability to select removal equipment suited for the operation and weather conditions
4.03.08	ability to select removal technique according to site conditions
4.03.09	ability to estimate area that can be removed and made watertight in a predetermined amount of time
4.03.10	ability to temporarily seal the roof
4.03.11	ability to temporarily drain the roof
4.03.12	ability to remove and dispose of roof materials to suit disposal equipment

Sub-task

4.04 Prepares roof substrate.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

4.04.01	knowledge of types of deck substrates such as concrete, steel and wood
4.04.02	knowledge of substrate defects such as dents, rotten wood, spalling concrete and corrosion
4.04.03	ability to clean substrate
4.04.04	ability to repair and replace damaged vapour barriers
4.04.05	ability to repair and replace damaged insulation
4.04.06	ability to identify structural defects
4.04.07	ability to secure loose substrate components

Sub-task

4.05 Adjusts heights of penetrations and parapets.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

Supporting Knowledge & Abilities

4.05.01	knowledge of new roof composition
4.05.02	knowledge of changes to roof mounted equipment
4.05.03	knowledge of types of adjustments such as adding slopes to coping and extending pipes, drains and doorsills
4.05.04	ability to calculate height of penetrations and parapets
4.05.05	ability to build extensions
4.05.06	ability to select material to suit existing and new construction
4.05.07	ability to dismantle existing construction
4.05.08	ability to add material to existing construction

Sub-task

4.06 Installs water cut-offs, temporary seals and temporary drains.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

Supporting Knowledge & Abilities

4.06.01	knowledge of types of water cut-offs such as temporary and permanent
4.06.02	knowledge of where and when water cut-offs, temporary seals and temporary drains are required

4.06.03	knowledge of types of materials for water cut-offs and temporary seals such as asphalt, sealant and membrane
4.06.04	knowledge of compatibility of materials used
4.06.05	ability to verify integrity of water cut-offs, temporary seals and temporary drains
4.06.06	ability to remove water cut-offs, temporary seals and temporary drains

Task 5 Prepares roof for new installation.

Context: Before installing a new roofing system, roofers need to ensure that all surfaces that will receive roofing are clean, dry, free of defects and secured in place. The performance of the roof depends on the quality of the substrate and its components.

Sub-task

5.01 Cleans deck.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

5.01.01	knowledge of types of decks such as steel, wood and concrete
5.01.02	knowledge of when and how much of the deck to clean
5.01.03	knowledge of the extent of cleaning required
5.01.04	knowledge of hazards associated with methods of cleaning decks such as rust from phenolic insulation
5.01.05	ability to remove construction debris using brooms, power brooms, vacuum and air compressor
5.01.06	ability to remove contaminants such as oil, fuel and concrete
5.01.07	ability to limit access to area that has been cleaned

Sub-task

5.02 Inspects deck.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

5.02.01	knowledge of types of decks such as steel, wood and concrete
5.02.02	knowledge of inspection requirements
5.02.03	knowledge of when to inspect deck
5.02.04	knowledge of types of defects that will affect the performance of the roof such as height, irregularities, deflection of deck, uncured concrete and corrosion
5.02.05	ability to locate defects
5.02.06	ability to determine severity of defects
5.02.07	ability to notify responsible parties of defects

Sub-task

5.03 Verifies placement of roof penetrations and parapets.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	no	NV

5.03.01	knowledge of required penetrations and parapets
5.03.02	knowledge of height and fastening requirements
5.03.03	knowledge of locations of penetrations and parapets
5.03.04	knowledge of required components of the penetration such as drains, flashings and chimney flashings
5.03.05	knowledge of clearances and placement

5.03.06	ability to verify if all penetration components are on site
5.03.07	ability to verify if cants, blocking, reglets and nailers are secured in place
5.03.08	ability to verify that materials used for parapets and penetrations are compatible with roof system

Sub-task

5.04 Dries deck.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

5.04.01	knowledge of types of drying techniques such as vacuuming, dry mopping and torching
5.04.02	knowledge of hazards of drying techniques
5.04.03	knowledge of effect of weather conditions on drying time
5.04.04	knowledge of types of deck such as steel, wood and concrete
5.04.05	ability to determine area to be dried
5.04.06	ability to determine when deck is dry enough to proceed with roofing
5.04.07	ability to protect the deck to limit exposure to moisture

BLOCK C

LOW SLOPE AND FLAT ROOFING

Trends: *Due to fire safety concerns, processes have been modified to reduce the use of flame on combustible material. There is an increase in the use of single-ply roof systems. "Green roofing" is growing in popularity.*

Related Components: Structural deck, lightning rods, mechanical equipment anchors, flashings, adhesives, fasteners, membrane, vapour barriers, insulation, protection board, drains, vents, fixtures, gravel, ballast, primers, asphalt, curbs, roof hatch, parapet.

Tools and Equipment: Hand tools, power tools, pneumatic tools, powder actuated tools, propane-fuelled equipment, hoisting, rigging and lifting equipment, hot process equipment, PPE and safety equipment.

Task 6 Applies built-up roofing components.

Context: *Roofing components work together to provide overall protection of the building.*

Sub-task

6.01 Installs gypsum board.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

6.01.01	knowledge of manufacturers' specifications
6.01.02	knowledge of types of gypsum board
6.01.03	knowledge of types of adhesives
6.01.04	knowledge of joint sealing requirements
6.01.05	knowledge of types of mechanical fasteners such as nails, screws, clips and plates
6.01.06	knowledge of fastener pattern layout required
6.01.07	knowledge of types of installation methods such as glued-down, loose-laid and mechanically fastened
6.01.08	ability to cut, fit and place gypsum board

6.01.09	ability to install mechanical fasteners
6.01.10	ability to seal joints
6.01.11	ability to install adhesives

Sub-task

6.02 Primes substrate.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

6.02.01	knowledge of types of primers such as water-based and solvent-based
6.02.02	knowledge of effects of environmental conditions on application of primer
6.02.03	knowledge of manufacturers' specifications
6.02.04	ability to apply primer with spray applicators, rollers and brushes

Sub-task

6.03 Applies vapour barrier and air barrier.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

6.03.01	knowledge of types of vapour barrier and air barrier such as polyethylene, peel-and-stick, torched-on (SBS), kraft laminate and two-ply felt
6.03.02	knowledge of manufacturers' specifications
6.03.03	knowledge of types of vapour barrier and air barrier adhesives and application methods
6.03.04	knowledge of compatibility of different types of vapour barrier and air barrier
6.03.05	knowledge of amount of side and end laps

6.03.06	ability to cut, fit and place material
6.03.07	ability to overlap, seam and seal joints
6.03.08	ability to tie vapour barrier and air barrier into building envelope
6.03.09	ability to ensure continuity of vapour barriers and air barriers at penetrations and at intersections of roofs and walls

Sub-task

6.04 Installs insulation.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

6.04.01	knowledge of types of insulation such as rigid, foam and fibreglass
6.04.02	knowledge of manufacturers' specifications
6.04.03	knowledge of sloped-insulation systems
6.04.04	knowledge of inverted roof systems
6.04.05	knowledge of application methods such as adhered, loose-laid and mechanically fastened
6.04.06	knowledge of fastener pattern layout requirement
6.04.07	ability to establish layout pattern
6.04.08	ability to cut, fit and place material
6.04.09	ability to maintain pattern
6.04.10	ability to maintain material integrity during installation
6.04.11	ability to install mechanical fasteners
6.04.12	ability to install adhesives

Sub-task

6.05 Installs protection board.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

6.05.01	knowledge of types of protection board such as wood fibre, fibreglass, SBS boards and asphalt-impregnated
6.05.02	knowledge of manufacturers' specifications
6.05.03	knowledge of application methods
6.05.04	knowledge of compatibility of materials
6.05.05	ability to cut, fit and place material
6.05.06	ability to establish layout pattern
6.05.07	ability to secure protection board materials

Sub-task

6.06 Installs drains, vents and roof fixtures.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

6.06.01	knowledge of drain locations
6.06.02	knowledge of drain components and accessories
6.06.03	knowledge of flashings for vents and roof fixtures such as B-vents and plumbing vents
6.06.04	ability to sump drain areas
6.06.05	ability to reinforce roof details
6.06.06	ability to waterproof roof details such as drains and fixtures
6.06.07	ability to assess component integrity

6.06.08	ability to protect fixture components during construction
6.06.09	ability to determine fixture elevations

Sub-task

6.07 Applies ballast and protective surface.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

6.07.01	knowledge of types of ballast such as roofing stone, pavers and cement-top insulation
6.07.02	knowledge of types of protective surfaces such as reflective coatings and pea gravel
6.07.03	knowledge of protection mat for lightweight inverted roofing systems
6.07.04	knowledge of application rates
6.07.05	knowledge of compatibility of protective coatings and membranes
6.07.06	knowledge of application methods
6.07.07	knowledge of environmental concerns such as UV damage and wind up-lift
6.07.08	ability to determine ballast properties such as the size and the type
6.07.09	ability to spread material evenly
6.07.10	ability to cut, fit and place patio stones
6.07.11	ability to cut, fit and place ballast blanket

Sub-task

6.08 Installs walkways.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

6.08.01	knowledge of types of walkway products
6.08.02	knowledge of locations of walkways
6.08.03	knowledge of methods to protect membranes
6.08.04	ability to lay out, cut, fit and place materials
6.08.05	ability to maintain material elevation

Sub-task

6.09 Installs metal flashings.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

6.09.01	knowledge of types of metal flashings such as aluminium, copper and stainless steel
6.09.02	knowledge of types of fasteners
6.09.03	knowledge of compatibility of fasteners and flashings
6.09.04	knowledge of fitting methods
6.09.05	knowledge of watershed design principles
6.09.06	knowledge of expansion and contraction of flashings
6.09.07	ability to cut, fit, finish and fasten metal flashings
6.09.08	ability to caulk flashings

Sub-task

6.10 Installs inverted roofing systems (Protected Membrane Roofs – PMR).

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

6.10.01	knowledge of inverted roof assembly
6.10.02	knowledge of inverted roof components
6.10.03	ability to cut, fit and place components
6.10.04	ability to maintain consistent membrane thickness
6.10.05	ability to inspect membrane integrity

Task 7 Applies membranes.

Context: Applying membranes is an essential part of the roofing trade because this prevents water from entering a building and prevents damage to building components.

Sub-task

7.01 Relaxes membrane.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

7.01.01	knowledge of types of membranes that require relaxing
7.01.02	knowledge of time required to relax membrane
7.01.03	knowledge of techniques for relaxing membranes such as warming with torch and laying in place
7.01.04	knowledge of effects of environmental conditions such as temperature, wind and moisture

7.01.05	ability to assess membrane flexibility
7.01.06	ability to unroll membrane
7.01.07	ability to weigh down membrane

Sub-task

7.02 Sets membranes.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

7.02.01	knowledge of types of membranes such as built-up roofing (BUR), modified bitumen and single-ply
7.02.02	knowledge of amount of side and end laps
7.02.03	knowledge of membrane setting techniques such as throwing felt, dry setting and back rolling
7.02.04	ability to establish starting point
7.02.05	ability to cut, fit and place membranes
7.02.06	ability to remove air from under membrane
7.02.07	ability to position sheets and rolls of membrane
7.02.08	ability to spot ballast membrane using material such as rock and lumber

Sub-task

7.03 Applies membranes using hot process.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

7.03.01	knowledge of types of hot process-applied membranes such as felt paper, fibreglass and sanded modified sheets
7.03.02	knowledge of hot process equipment such as mops, squeegees and mechanical applicators
7.03.03	knowledge of types of asphalt such as 1, 2, 3
7.03.04	ability to determine temperature of asphalt
7.03.05	ability to transport asphalt
7.03.06	ability to spread asphalt
7.03.07	ability to roll membranes into asphalt

Sub-task

7.04 Applies membranes using torched-on method.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

7.04.01	knowledge of types of equipment such as torches, tanks and dollies
7.04.02	knowledge of when to use torched-on method
7.04.03	knowledge of importance of continuous adhesion
7.04.04	knowledge of amount of side and end laps
7.04.05	knowledge of amount of offset of base and cap sheets
7.04.06	knowledge of company policy on fire watch

7.04.07	ability to adjust torch flame
7.04.08	ability to determine amount of heat required to weld surfaces
7.04.09	ability to use sponge to ensure surfaces are bonded
7.04.10	ability to maintain continuity of bitumen bleedout
7.04.11	ability to apply proper temperature to embed granules

Sub-task

7.05 Applies membranes using hot-air welding.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

7.05.01	knowledge of types of membranes that require heat welding such as polyvinyl chloride (PVC) and thermoplastic polyolefin (TPO)
7.05.02	knowledge of types of hot-air welders such as automatic and hand-held
7.05.03	knowledge of membrane cleaners and sealants
7.05.04	knowledge of effects of environmental conditions on application
7.05.05	ability to operate automatic seamer
7.05.06	ability to apply membrane cleaners and sealants
7.05.07	ability to determine when welder is at proper temperature
7.05.08	ability to operate roller with hand-held welder
7.05.09	ability to test and probe seams for continuity

Sub-task

7.06 Applies membranes using cold process.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	no	NV

7.06.01	knowledge of types of membranes that can be applied using cold process
7.06.02	knowledge of types of adhesives such as contact cement, seam tape and primer
7.06.03	knowledge of amount of side and end laps
7.06.04	knowledge of effects of environmental conditions on application
7.06.05	ability to spread adhesives uniformly
7.06.06	ability to clean membranes
7.06.07	ability to roll seams
7.06.08	ability to roll back membrane
7.06.09	ability to determine when adhesives are set up
7.06.10	ability to prepare peel-and-stick membranes

Sub-task

7.07 Applies membranes using mechanical fasteners.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

7.07.01	knowledge of roofing systems requiring mechanical fastening
7.07.02	knowledge of types of mechanical fasteners such as screws, plates and bars
7.07.03	knowledge of types of decking such as wood , concrete and steel

7.07.04	knowledge of manufacturers' specifications for layout and types of fasteners
7.07.05	ability to determine pattern and length
7.07.06	ability to locate utilities such as water lines, electrical equipment and drainage systems
7.07.07	ability to perform pull-out test

Sub-task

7.08 Applies loose-laid membranes.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

7.08.01	knowledge of types of membranes that can be installed using loose-laid method such as ethylene-propylene-diene monomer (EPDM) and modified bituminous membrane
7.08.02	knowledge of types of ballast such as roofing stone, pavers and cement-top insulation
7.08.03	knowledge of perimeter securing requirements
7.08.04	knowledge of fasteners such as screws, plates and bars
7.08.05	knowledge of types of adhesives such as contact cement, seam tape and primer
7.08.06	knowledge of amount of side and end laps
7.08.07	knowledge of effects of environmental conditions on application
7.08.08	ability to spread adhesives uniformly
7.08.09	ability to clean membranes
7.08.10	ability to apply protection mat
7.08.11	ability to roll seams
7.08.12	ability to roll back membrane

7.08.13	ability to determine when adhesives are set up
7.08.14	ability to apply ballast on perimeter
7.08.15	ability to determine amount of installed ballast
7.08.16	ability to apply ballast on membrane

Sub-task

7.09 Installs membrane flashings. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

7.09.01	knowledge of types of membrane flashings such as modified bitumen, felt, rubber and pressure sensitive
7.09.02	knowledge of starting point
7.09.03	knowledge of locations requiring flashing such as curbs, parapets and roof upstands
7.09.04	knowledge of adhesives and sealants required
7.09.05	ability to cut membrane to fit location
7.09.06	ability to shape membrane
7.09.07	ability to apply successive layers
7.09.08	ability to back mop flashings
7.09.09	ability to apply adhesives and sealants

Sub-task

7.10 Installs liquid-applied roofing membrane.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	no	NV

Supporting Knowledge & Abilities

7.10.01	knowledge of types of liquid-applied membranes such as hot rubber and asphalt
7.10.02	knowledge of reinforcement materials
7.10.03	knowledge of two-part application
7.10.04	ability to operate specialized equipment such as heating kettle and dispensing buggy
7.10.05	ability to apply membrane with spray applicators, rollers, squeegees, mops and brushes
7.10.06	ability to determine membrane thickness

BLOCK D

SHINGLES, TILES AND PREFORMED METAL ROOFING

Trends: *Designs for shingles, tiles and metals have changed significantly. Roof components are increasingly designed to meet architectural and longevity concerns. Customer choice in these products has increased. Underlayment materials and application methods have improved to prevent leakage from ice damming.*

Related Components: **Shingled Roofing Components:** nails, staples, underlayment (felt, ice and water shield, polyethylene), asphalt shingles, fibreglass shingles, SBS shingles, laminate shingles, wood shingles and shakes, mastics, flashings.

Tiled Roofing Components: nails, screws, clay tiles, concrete tiles, slate tiles, metal tiles, composite tiles, mortar, underlayment (felt, ice and water shield, polyethylene), flashings, closure strips, caulking.

Metal Roofing Components: preformed metal, screws, clips, pop rivets, butyl tape, caulking, snow guards, flashings, underlayment (felt, peel-and-stick membranes), closure strips.

Tools and Equipment: Hand tools, power tools, pneumatic tools, powder actuated tools, propane-fuelled equipment, hoisting, lifting and rigging equipment, PPE and safety equipment.

Task 8 **Applies shingles.**

Context: *Shingles are in high demand in residential and commercial projects.*

Sub-task

8.01 **Installs flashings for shingled roofs.**

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

8.01.01 knowledge of types of flashings such as drip edge, rake edge, chimney, step, base, counter, thru-wall and back pan flashing

8.01.02 knowledge of compatibility of metals and fasteners

8.01.03 knowledge of plumbing vents and goose neck exhausts

8.01.04	ability to cut, form and mitre flashings
8.01.05	ability to select fasteners for specific application to substrate
8.01.06	ability to caulk flashings
8.01.07	ability to determine where flashings are needed

Sub-task

8.02 Installs saddles/crickets.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

8.02.01	knowledge of basic carpentry
8.02.02	ability to determine saddle/cricket locations such as behind chimneys and other roof penetrations
8.02.03	ability to design saddles/crickets for specific applications
8.02.04	ability to build saddles/crickets

Sub-task

8.03 Installs underlayment for shingled roofs.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

8.03.01	knowledge of types of underlayment such as felt, polyethylene, peel-and-stick and mineral surfaced
8.03.02	knowledge of compatibility of underlayments with shingles
8.03.03	knowledge of causes of ice damming

8.03.04	knowledge of potential problems caused by ice damming and condensation
8.03.05	knowledge of installation methods and locations
8.03.06	knowledge of applications for different slopes
8.03.07	ability to relax underlayment
8.03.08	ability to measure, cut, fit and place underlayment
8.03.09	ability to apply peel-and-stick underlayment
8.03.10	ability to overlap material

Sub-task

8.04 Determines layout of shingles. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

8.04.01	knowledge of exposure and overlap allowances
8.04.02	knowledge of shape and slope of roof
8.04.03	knowledge of shingle patterns such as brick and random pattern
8.04.04	ability to establish starting point
8.04.05	ability to measure and apply chalk line
8.04.06	ability to establish starter course
8.04.07	ability to match coursing at dormers

Sub-task

8.05 Fastens shingles.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

8.05.01	knowledge of types and lengths of fasteners such as nails and staples
8.05.02	knowledge of nailing patterns
8.05.03	knowledge of exposure and overlap allowances
8.05.04	knowledge of waterlines on wood shingles
8.05.05	ability to maintain shingle pattern
8.05.06	ability to set nailing gun pressure
8.05.07	ability to fasten hip and ridge caps

Sub-task

8.06 Tabs shingles.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

8.06.01	knowledge of wind-proofing methods
8.06.02	ability to lift tab without damaging shingle
8.06.03	ability to select adhesive
8.06.04	ability to caulk

Sub-task

8.07 Installs vents for shingled roofs.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

Supporting Knowledge & Abilities

8.07.01	knowledge of reasons for venting spaces
8.07.02	knowledge of types of vents such as attic, ridge and turbine
8.07.03	knowledge of vent flashings
8.07.04	ability to calculate number of vents
8.07.05	ability to determine locations of vents
8.07.06	ability to cut holes in roof deck
8.07.07	ability to seal roof projections with mastics and caulking

Sub-task

8.08 Cuts shingles.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

Supporting Knowledge & Abilities

8.08.01	knowledge of cutting techniques for wood and asphalt
8.08.02	ability to cut shingles around flashings, vents, projections, edges, valleys and capping
8.08.03	ability to establish chalk line
8.08.04	ability to cut ridge caps

Task 9 Applies roof tiles.

Context: Tiles are generally used for their longevity, architectural and fire retardant qualities.

Sub-task

9.01 Installs underlayment for tiled roofs.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	no	NV	yes	yes	yes	yes	yes	NV	no	NV

Supporting Knowledge & Abilities

9.01.01	knowledge of types of underlayment such as felt, mineral surfaced roll roofing and metal
9.01.02	knowledge of plumbing vents and goose neck exhausts
9.01.03	knowledge of installation methods
9.01.04	knowledge of reasons for underlayment such as ice and water back-up protection
9.01.05	ability to measure, cut, fit and place underlayment
9.01.06	ability to overlap material

Sub-task

9.02 Installs vents for tiled roofs.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	no	NV	yes	yes	yes	yes	yes	NV	no	NV

Supporting Knowledge & Abilities

9.02.01	knowledge of reasons for venting attic spaces
9.02.02	knowledge of types of vents such as attic, ridge and turbine
9.02.03	ability to determine number and locations of vents
9.02.04	ability to cut holes in roof deck
9.02.05	ability to seal vents to underlayment

Sub-task

9.03 Installs flashings for tiled roofs.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	no	NV	yes	yes	yes	yes	yes	NV	no	NV

9.03.01	knowledge of types of flashings such as drip edge, rake edge, chimney, base, counter, thru-wall and back pan flashing
9.03.02	knowledge of compatibility of metals and fasteners
9.03.03	ability to determine where flashing is needed
9.03.04	ability to select fastener for specific application to substrate
9.03.05	ability to caulk flashings
9.03.06	ability to cut, form and mitre flashings

Sub-task

9.04 Installs strapping.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	no	NV	yes	yes	yes	yes	yes	NV	no	NV

9.04.01	knowledge of basic carpentry
9.04.02	knowledge of types of fasteners such as screws and nails
9.04.03	ability to determine size, spacing and location of strapping
9.04.04	ability to identify rafter location and nailing pattern
9.04.05	ability to cut, fit and place strapping
9.04.06	ability to use chalk lines to establish layout pattern

Sub-task

9.05 Installs starter strips.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	no	NV	yes	yes	yes	yes	yes	NV	no	NV

9.05.01	knowledge of location of starter strips
9.05.02	ability to establish height of starter strips
9.05.03	ability to stagger starter strip butt joints
9.05.04	ability to establish start line

Sub-task

9.06 Installs closure strips.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	no	NV	yes	yes	yes	yes	yes	NV	no	NV

9.06.01	knowledge of types of closure strips such as foam closures, bird stops and screens
9.06.02	knowledge of purpose of closure strips
9.06.03	knowledge of installation methods
9.06.04	ability to secure closure strips

Sub-task

9.07 Fastens roof tiles.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	no	NV	yes	yes	yes	yes	yes	NV	no	NV

9.07.01	knowledge of types of fasteners such as screws and nails
9.07.02	knowledge of specified fastening pattern
9.07.03	ability to interlock tiles

9.07.04	ability to maintain tile pattern
9.07.05	ability to prevent tile damage during installation
9.07.06	ability to fasten hip and ridge caps

Sub-task

9.08 Cuts roof tiles.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	no	NV	yes	yes	yes	yes	yes	NV	no	NV

9.08.01	knowledge of specialized cutting tools such as diamond bit blades and tile cutters
9.08.02	ability to use template or jig to cut straight lines
9.08.03	ability to cut tiles around flashings, vents, projections, edges, valleys and capping

Sub-task

9.09 Mortars ridge capping and valleys.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	no	NV	yes	yes	yes	yes	yes	NV	no	NV

9.09.01	knowledge of where to mortar
9.09.02	knowledge of suitable environmental conditions for applying mortar
9.09.03	ability to mix mortar with dye to match roof colour

Task 10 Applies pre-formed metal roofing.

Context: Metal roofs are popular in the warehouse and commercial construction sectors, especially in full metal buildings. They are available in a wide variety of colours and profiles.

Sub-task

10.01 Installs underlayment for pre-formed metal roofing.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

Supporting Knowledge & Abilities

10.01.01	knowledge of types of underlayment such as felt, mineral surfaced, peel-and-stick and modified bitumen
10.01.02	knowledge of amount of side and end laps
10.01.03	knowledge of installation methods
10.01.04	ability to measure, cut, fit and place underlayment

Sub-task

10.02 Installs strapping for pre-formed metal roofing.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

Supporting Knowledge & Abilities

10.02.01	knowledge of basic carpentry
10.02.02	knowledge of types of strapping such as Z-bar, wood and hat channels
10.02.03	knowledge of compatibility of strapping and metal roofing
10.02.04	knowledge of types of fasteners such as screws and nails
10.02.05	ability to use chalk lines to establish layout pattern

10.02.06	ability to cut, fit and place strapping
10.02.07	ability to anchor strapping

Sub-task

10.03 Installs closure strips for pre-formed metal roofing.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

10.03.01	knowledge of types of closure strips such as foam and metal
10.03.02	knowledge of purpose of closure strips
10.03.03	knowledge of location of closure strips
10.03.04	ability to cut, fit and place closure strips
10.03.05	ability to fasten closure strips using fasteners such as screws, caulking, pop rivets and staples

Sub-task

10.04 Fastens pre-formed metal roofing.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	NV	yes	yes	yes	yes	NV	yes	NV

10.04.01	knowledge of screws such as self-tapping and self-sealing
10.04.02	knowledge of manufacturers' specifications for screw placement and clip placement
10.04.03	knowledge of types of seams such as batten, S-lock, single and double-standing
10.04.04	ability to locate fastening points on roof joists and strapping

10.04.05	ability to operate specialized tools such as hand and power seamers
10.04.06	ability to set driver torque to prevent damage to screws, washers and panels
10.04.07	ability to place panels according to predetermined layout
10.04.08	ability to remove metal debris such as shavings, filings and screws

Sub-task

10.05 Applies flashings for pre-formed metal roofing.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	NV	yes	yes	yes	yes	NV	yes	NV

10.05.01	knowledge of types of flashings such as drip edge, rake edge, chimney, base, counter, thru-wall and back pan flashing
10.05.02	knowledge of compatibility of metals and fasteners
10.05.03	ability to determine where flashings, saddles and crickets are required
10.05.04	ability to cut, fit and mitre flashings
10.05.05	ability to fasten flashings with screws and rivets
10.05.06	ability to seal seams and screws using butyl tape
10.05.07	ability to caulk flashings

Sub-task

10.06 Cuts sheet metal.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

10.06.01	knowledge of specialized cutting tools such as aviation snips (left and right handed), nibblers, tin snips and quick-cut saws
10.06.02	ability to overlap corners
10.06.03	ability to calculate angles
10.06.04	ability to use chalk lines, T-squares and sliding T-bevel to cut straight lines

Sub-task

10.07 Installs ridge venting.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

10.07.01	knowledge of types of ridge venting such as pre-formed and hood
10.07.02	knowledge of purpose of ridge venting
10.07.03	knowledge of techniques used to apply ridge venting
10.07.04	ability to determine amount of venting required
10.07.05	ability to recognize ventilation problems

Sub-task

10.08 Installs snow guards.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

Supporting Knowledge & Abilities

10.08.01	knowledge of types of snow guards such as metal and plastic
10.08.02	knowledge of purpose of snow guards
10.08.03	knowledge of fastening methods such as welded, screwed and bolted
10.08.04	ability to fasten in uniform pattern
10.08.05	ability to follow installation specifications

BLOCK E

WATERPROOFING AND DAMP-PROOFING

Trends: *The use of modified bituminous membranes for waterproofing is increasing. Health and security at work apply mostly to soil and excavation conditions for the installation of the products mentioned below.*

Related Components: Primer, sheet membrane, protection material, two-part waterproofing membrane, hot rubber compound, cold process membrane.

Tools and Equipment: Hand tools, power tools, pneumatic tools, powder actuated tools, propane-fuelled equipment, hoisting, rigging and lifting equipment, hot process equipment, PPE and safety equipment.

Task 11 Waterproofs surfaces.

Context: *This work involves interior and exterior areas under hydrostatic pressure. Waterproofing applications are done on vertical, horizontal and sub grade surfaces. Waterproofing components include primers, insulation and membranes.*

Sub-task

11.01 Prepares surfaces.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

Supporting Knowledge & Abilities

11.01.01	knowledge of types of surfaces to be waterproofed such as wood, concrete and cinder blocks
11.01.02	knowledge of types of primers such as water-based and solvent-based
11.01.03	ability to recognize below-grade hazards
11.01.04	ability to scrape surface to remove irregularities
11.01.05	ability to fill cracks and gaps
11.01.06	ability to clean and dry surface using brooms and scrapers
11.01.07	ability to prime surface

Sub-task

11.02 Applies waterproofing membrane.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

11.02.01	knowledge of types of waterproofing membranes such as peel-and-stick, torch-on and hot rubber compound
11.02.02	knowledge of specialized heating requirements
11.02.03	knowledge of specialized detailing requirements
11.02.04	knowledge of amount of side and end laps
11.02.05	ability to recognize below-grade hazards
11.02.06	ability to cut, fit and place membranes
11.02.07	ability to apply hot rubber compound
11.02.08	ability to apply reinforcing ply at changes of direction

Sub-task

11.03 Applies protection board.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

11.03.01	knowledge of types of protection boards such as insulation, corrugated and drain mat
11.03.02	ability to recognize below-grade hazards
11.03.03	ability to cut, fit and place protection board
11.03.04	ability to secure board using adhesive and insulation anchors

Task 12 Damp-proofs surfaces.

Context: Damp-proofing involves mostly residential sub grade and exterior applications in areas that are typically not under hydrostatic pressure. Installations do not require a membrane and can be completed with single or multi-coat applications.

Sub-task

12.01 Applies primer.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	no	yes	NV	no	NV

12.01.01	knowledge of types of primers such as water-based and solvent-based
12.01.02	knowledge of application methods such as spraying, rolling and brushing
12.01.03	knowledge of effects of environmental conditions on application
12.01.04	ability to select primer for various surfaces such as wood, concrete, masonry and metal

Sub-task

12.02 Applies coatings.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	no	yes	NV	no	NV

12.02.01	knowledge of types of coatings such as fibrated, non-fibrated and rubberized
12.02.02	knowledge of number of coats required
12.02.03	knowledge of methods of application such as spraying, rolling and trowelling
12.02.04	knowledge of effects of environmental conditions on application

12.02.05	ability to recognize below-grade hazards
12.05.06	ability to select coating and tools for application

BLOCK F

ROOF MAINTENANCE

Trends: *There is a decrease in the use of hot asphalt for repair and maintenance. Due to environmental concerns, the use of cold products for repairing and maintaining roof systems has increased. Building owners are more aware of the advantages of maintaining the roof and are investing in maintenance programs. There is a trend to eliminate high maintenance items on a roof system; therefore, plastic pans and pitch pockets are being replaced by specialized flashings.*

Related Components: Caulking, mastic, sealant, drain, membrane, gravel, ballast, flashing, fasteners, asphalt, propane, fuel, roof system materials, primer.

Tools and Equipment: Hand tools, power tools, pneumatic tools, powder actuated tools, propane-fuelled equipment, hoisting, lifting and rigging equipment, hot process equipment, motorized equipment, PPE and safety equipment, disposal equipment.

Task 13 Assesses roof condition.

Context: *Roofers assess conditions to determine what actions are required to maintain a roof's performance, as acceptable to the owner.*

Sub-task

13.01 Inspects roof.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

Supporting Knowledge & Abilities

13.01.01	knowledge of types of roof systems such as single-ply, modified and asphalt
13.01.02	knowledge of when to inspect the roof
13.01.03	knowledge of where to look for defects
13.01.04	knowledge of history of leaks
13.01.05	knowledge of types of defects such as loose flashings, deteriorated caulking and sealant, and deteriorated membranes
13.01.06	knowledge of potential causes of damage such as air conditioning units, exhaust fans, doorways, ice build-up and wind

13.01.07	ability to identify defects
13.01.08	ability to identify areas that require immediate repair
13.01.09	ability to prioritize repair
13.01.10	ability to identify magnitude of repair
13.01.11	ability to identify cause of defect

Sub-task

13.02 Performs cut test.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

13.02.01	knowledge of roof systems such as single-ply, modified and asphalt
13.02.02	knowledge of when to perform a cut test
13.02.03	knowledge of where to perform a cut test
13.02.04	knowledge of composition of the roof
13.02.05	knowledge of compatibility of temporary sealant with roof system
13.02.06	ability to record and interpret cut test findings
13.02.07	ability to patch cut test area temporarily or permanently

Sub-task

13.03 Determines area that needs maintenance/repair.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

13.03.01	knowledge of roof systems such as single-ply, modified and asphalt

13.03.02	knowledge of compatible material for repair
13.03.03	knowledge of other potential causes of damage such as wall leaks, mechanical equipment and plumbing
13.03.04	knowledge of repair techniques
13.03.05	ability to identify extent of damage
13.03.06	ability to establish size of repair according to extent of damage and tie-in required

Sub-task

13.04 Determines maintenance/repair required.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

13.04.01	knowledge of roof systems such as single-ply, modified and asphalt
13.04.02	knowledge of repair such as caulking and coating
13.04.03	knowledge of types of maintenance such as caulking, refilling and resecuring loose flashing
13.04.04	knowledge of compatible materials
13.04.05	knowledge of present and future building use
13.04.06	ability to determine feasibility of maintenance or repair
13.04.07	ability to determine if temporary or permanent repair can be performed
13.04.08	ability to determine material required for maintenance or repair
13.04.09	ability to determine time frame required for maintenance or repair

Task 14 Maintains roof.

Context: Roofers perform roof maintenance to address normal wear in order to extend the service life of the roof systems and avoid major and unplanned repairs.

Sub-task

14.01 Maintains drains and scuppers.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

14.01.01	knowledge of types of drains such as internal and external
14.01.02	knowledge of drain components
14.01.03	knowledge of installation of drains and scuppers
14.01.04	knowledge of types of maintenance such as removal of debris and vegetation
14.01.05	knowledge of types of roof systems such as single-ply, modified and asphalt
14.01.06	ability to verify if drains and scuppers are sealed
14.01.07	ability to inspect drains and scuppers for defects
14.01.08	ability to dismantle and assemble drains
14.01.09	ability to clean drains and scuppers
14.01.10	ability to reseal membrane to drains and scuppers

Sub-task

14.02 Refills pitch pockets.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

14.02.01	knowledge of types of pitch pockets such as metal, wood and concrete
14.02.02	knowledge of types of sealant such as mastic and two-part pourable sealer
14.02.03	knowledge of types of membranes used
14.02.04	ability to install mastic or two-part pourable sealer
14.02.05	ability to determine quantity of mastic/sealer required
14.02.06	ability to prepare surface prior to refilling
14.02.07	ability to crown mastic in pitch pocket
14.02.08	ability to determine if penetration is hot or cold
14.02.09	ability to ensure that pitch pocket is well secured
14.02.10	ability to determine if pitch pocket requires refill or replacement

Sub-task

14.03 Replaces deteriorated caulking and sealant.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

14.03.01	knowledge of types of caulking such as silicone, polyurethane and latex
14.03.02	knowledge of caulking application

14.03.03	knowledge of compatibility of caulking and surface
14.03.04	knowledge of effect of environmental conditions on caulking
14.03.05	knowledge of curing times for caulking
14.03.06	ability to remove old caulking material
14.03.07	ability to prepare surface prior to caulking
14.03.08	ability to apply caulking

Sub-task

14.04 Repairs membrane defects. **Supporting Knowledge & Abilities**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

14.04.01	knowledge of types of membranes such as asphalt impregnated felt, SBS, EPDM and TPO
14.04.02	knowledge of membrane installation procedures
14.04.03	knowledge of defects such as blisters, ridges, splits, rips and delamination
14.04.04	knowledge of compatibility of materials
14.04.05	knowledge of repair techniques such as cold and hot process repair
14.04.06	ability to prepare surface prior to repair
14.04.07	ability to install new membranes
14.04.08	ability to resurface membrane with materials such as gravel, coatings and ballast

Sub-task

14.05 Applies surfacing and ballast to bare areas.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

14.05.01	knowledge of types of surfaces such as asphalt, SBS and EPDM
14.05.02	knowledge of types of ballast such as roofing stone, pavers and cement-top insulation
14.05.03	knowledge of types of surfacing such as granular, coating and gravel
14.05.04	knowledge of when surface requires resurfacing
14.05.05	knowledge of compatibility of materials used
14.05.06	knowledge of effects of environmental conditions on surfaces
14.05.07	ability to prepare surface prior to resurfacing
14.05.08	ability to determine application methods of surfacing

Sub-task

14.06 Resecures loose metal flashings.

Supporting Knowledge & Abilities

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
NV	yes	NV	yes	NV	yes	yes	yes	yes	yes	NV	yes	NV

14.06.01	knowledge of types of fasteners such as screws, nails and clips
14.06.02	knowledge of types of flashings such as cap, counter and thru-wall flashings
14.06.03	knowledge of flashing installation
14.06.04	ability to identify problem flashings

14.06.05	ability to remove and reinstall flashings
14.06.06	ability to form and fit replacement flashings
14.06.07	ability to match gauge and colour of flashings
14.06.08	ability to caulk seams of flashings

APPENDICES

TOOLS AND EQUIPMENT

Hand Tools

adhesive spreader
air and material hoses
aviation snips (left and right handed)
axe
broom
bucket/pail
caulking gun
chalk line
chisels
drying mop
flashlight
folding pliers
grub hoe
hacksaw
hammer
hammer stapler
hand saw
hand spudder
hand roller
hatchet
infrared heat gun
manual gravel spreader
manual insulation carrier
measuring tape
mechanical tape applicator
mop
pipe wrench
plane
pop riveter
pry bar
rake
ramrod
roof jack
roof lifter
roofer knife
sawhorse
scanners
scissors
scoop shovel
scraper
screwdriver
seam roller
shovel
slater punch
sliding T-bevel
staple gun
spade
squeegee
thermometer
tin snips
trowel
wheelbarrow
water extractor
wrench

Power Tools, Pneumatic Tools, Powder Actuated Tools and Propane-Fuelled Equipment

air compressor
backpack blower
concrete saw
electrical cord
generator
hammer drill
hot air gun
hot air welder
industrial vacuum
nibbler
pneumatic caulking gun
pneumatic spray gun
powder actuated tool
power mixer
power saws (chain, concrete, quick- cut, circular)
power vac
pressure washer
primer machine
propane tank
pump
roll carrier

Power Tools, Pneumatic Tools, Powder Actuated Tools and Propane-Fuelled Equipment (continued)

roller
screw gun
spray gun and nozzle
torch
unishear
tile cutter

Hoisting, Lifting and Rigging Equipment

A-frame hoist
bottle cages
conveyor
crane
gravel bucket
gravel hopper
hand hoist
hydraulic hoist
ladder
ladder hoist
ladder jack
ladder pulley
lifting fork
mechanical hoist
monorail hoist
swing hoist

Hot Process Equipment

agitator kettle
asphalt spreader
automated seamer
bitumen kettle
bitumen mop
bitumen pump and piping
bitumen tanker
degranulator
dipper
felt laying machine
hot tanker/carrier
mini mop
mop cart
truck tanker
wheeled asphalt bucket

Motorized Equipment

chainsaw
forklift
man-lift
mechanical broom
mechanical scraper
power broom
power buggy
power gravel spreader
power insulation carrier
power scraper or mechanical spudder
power spreader
rocker
roof cutter
roof cutting machine
scissor lift
skid steer loader
snow blower
tear-off machine

Personal Protective Equipment and Safety Equipment

ear muffs
eye wash bottle
face shield
first aid kit
gloves
hard hat
heat sensors
lanyard (rope)

Personal Protective Equipment and Safety Equipment (cont'd)

long sleeves
mask
parapet
portable fire extinguisher
respirator
safety boots
safety fence
safety glasses
safety harness

Disposal Equipment

disposal bin
disposal chute
garbage bags
garbage chute
garbage tray
wheelbarrow

GLOSSARY

asphalt	although there are natural occurring asphalts, those used in roofing in Canada are from the heavy end of petroleum distillation and can be obtained in a great range of viscosities and softening points
bitumen	a generic term describing any mixture of heavy hydrocarbons in viscous or solid form; in the roofing industry, the word covers both asphalt and coal tar pitch
caulking/sealant	any of a wide range of bituminous, rubber, plastic or other materials suitable for filling seams or cracks to make them tight against water leakage and remain plastic for an extended time after application
cricket	a device that is used to divert water at the intersections of roofs or at the intersection of a roof and chimney; (also called saddle)
deck	the structural roof to the top surface of which a roof covering system is applied
drip edge	the formed edge on metal installed at the eaves of a roof
eave	the edge of a sloped roof
fabric	a woven cloth of organic or inorganic filaments treated with bitumen and, being stronger than felt, used in special flashing applications
fascia	any cover board at the edge or eaves of a flat or sloping overhanging roof
felt	a mat of organic or inorganic fibres, in sheet form impregnated with asphalt or coal tar, and supplied in roll form
flashing - base flashing (metal)	sheet metal covering the cant and up the vertical surface, protecting the membranes
flashing - cap flashing	the covering, usually sheet metal, over the base flashing, or capping a higher wall, such as a parapet
flashing - counter flashing	sometimes used for the upper portion of the sheet metal flashing when the metal flashing is divided into two pieces; **see also** cap flashing
flashing - membrane flashing	a continuation of the roofing proper to cover any element of the roof structure departing from the roof deck incline
flashing - step flashing	individual pieces of flashing material used to flash the sides of chimneys and dormers and similar projections on sloping shingled roofs; the individual pieces are overlapped and stepped up the slope

flashing - thru-wall flashing	flashing extending completely through a masonry wall to prevent water infiltrating behind lower elements of the flashing system and of the roofing system
flat roof	roof under 1:4 pitch (single unit)
hip	the high point where 2 sloped planes meet
insulation	**see** roof insulation
inverted roofing system	a roofing system wherein the roofing membrane is applied to the sloped structural deck and the insulation is placed outward of the membrane and ballasted
kettle temperature	the temperature of the hot material in the kettle
lap	the part of shingles, roll roofing or felt covered in application by the following course or ply
- **edge lap**	the overlap of the edge of a ply over the previous ply
- **end lap**	the overlap of the start of a roll over the end of the previous roll
membrane	a waterproof covering; it may be a single-ply system or a multi-ply system
mopping	a layer of hot bitumen mopped between layers of roofing
plastic cement	although all caulking cements could be called plastic cements, there is a commonly held acceptance in the roofing industry that plastic cement means bituminous cement; these can be either asphalt or coal tar base with the former much more common; these are a mixture of bitumen, asbestos fibres, filler and suitable solvent; **see also** caulking cement
plastic pan	also called pitch pan, pitch pocket, gum box, these comprise a flanged collar placed around items that project through the roof system; the flange is properly set into the roof membrane and the pan is well filled with plastic cement; these pans are a constant source of trouble and should only be used when no other solution can be found
primer	a thin liquid compound applied to a surface to improve the adhesion of a thicker liquid compound; the most commonly used is asphalt primer
protected membrane roof (PMR)	a roofing system wherein the roofing membrane is applied to the sloped structural deck and the insulation is placed outward of the membrane and ballasted; (also called inverted roof, upside down roof)
ridge	the top of a sloped roof
saddle	a small false roof or the elevation of a part of the roof surface used to divert water from behind an obstacle, such as a chimney; (also called cricket)
scupper	a perimeter drain for roofs

slope	the incline of a roof surface (also called pitch)
snow guards	a roofing projection that is installed on sloped roofs to ensure that large sheets of ice or snow do not fall; similar to snow rails
stapling	the use of a specially designed staple gun and staples instead of a hammer and roofing nails in roofing application
starter strip	a roofing material applied at the eaves and serving as a base for the first course of roofing
surfacing	any aggregate or granular material used as a protective covering on the weather surface of a roof
underlayment	material that is laid under the roofing and provides a secondary form of protection
valley	the low point where two sloped planes meet
vapour retarder	material used to retard the passage of vapour or moisture into the roof system where harmful condensation of vapour within the system could take place
venting	in built-up roofing the installation of special provisions to allow the roof insulation to vent to the outside; this can be done at roof edges, at parapet walls, by installation of special roof vents and expedited by using roof insulation which will allow air and vapour movement

Source Material:

Canadian Roofing Contractors Association.
Glossary of Common Roofing Terms.
In Canadian Roofing Reference Manual. Ottawa : The Association, revised 1999.

ACRONYMS

BUR	built-up roofing
EPDM	ethylene-propylene-diene monomer
EVT	equiviscous temperature
MSDS	Material Safety Data Sheets
PPE	personal protective equipment
PMR	Protected Membrane Roofs
PVC	polyvinyl chloride
SBS	styrene-butadiene-styrene
TPO	thermoplastic polyolefin
WHMIS	Workplace Hazardous Materials Information System

BLOCK AND TASK WEIGHTING

BLOCK A OCCUPATIONAL SKILLS

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	NV	8	NV	15	NV	10	18	13	25	15	NV	15	NV	15%

Task 1 Uses tools and equipment.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	20	NV	36	NV	40	20	35	33	70	NV	50	NV	38%

Task 2 Organizes work.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	50	NV	33	NV	20	40	35	33	15	NV	20	NV	31%

Task 3 Prepares work site.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	30	NV	31	NV	40	40	30	34	15	NV	30	NV	31%

BLOCK B ROOF PREPARATION

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	NV	37	NV	24	NV	10	18	20	10	15	NV	9	NV	18%

Task 4 Prepares roof for replacement.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	60	NV	56	NV	60	50	40	35	60	NV	65	NV	53%

Task 5 Prepares roof for new installation.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	40	NV	44	NV	40	50	60	65	40	NV	35	NV	47%

BLOCK C LOW SLOPE AND FLAT ROOFING

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	NV	29	NV	30	NV	40	18	46	30	30	NV	44	NV	33%

Task 6 Applies built-up roofing components.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	60	NV	50	NV	40	50	50	60	20	NV	40	NV	46%

Task 7 Applies membranes.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	40	NV	50	NV	60	50	50	40	80	NV	60	NV	54%

BLOCK D SHINGLES, TILES AND PREFORMED METAL ROOFING

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	NV	9	NV	5	NV	15	10	8	20	30	NV	15	NV	14%

Task 8 Applies shingles.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	30	NV	68	NV	60	60	40	45	90	NV	50	NV	56%

Task 9 Applies roof tiles.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	30	NV	0	NV	20	20	10	20	7	NV	0	NV	13%

Task 10 Applies pre-formed metal roofing.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	40	NV	32	NV	20	20	50	35	3	NV	50	NV	31%

BLOCK E WATERPROOFING AND DAMP-PROOFING

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	NV	10	NV	10	NV	10	18	3	5	5	NV	5	NV	8%

Task 11 Waterproofs surfaces.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	70	NV	68	NV	80	50	60	100	80	NV	100	NV	76%

Task 12 Damp-proofs surfaces.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	30	NV	32	NV	20	50	40	0	20	NV	0	NV	24%

BLOCK F ROOF MAINTENANCE

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	NV	7	NV	16	NV	15	18	10	10	5	NV	12	NV	12%

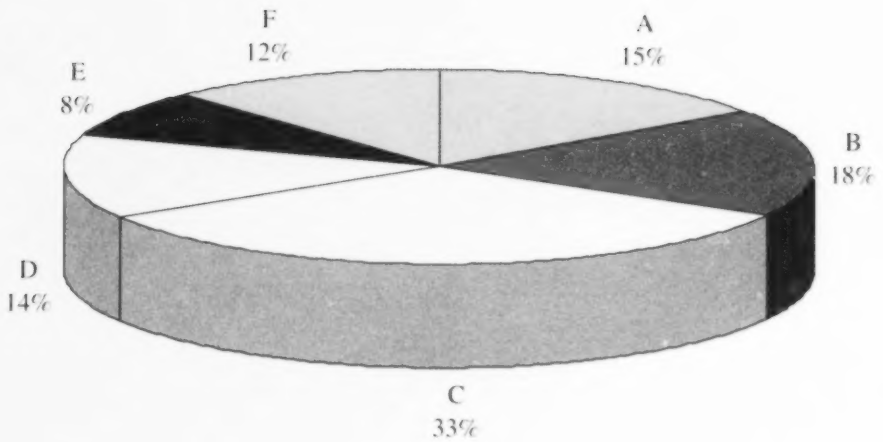
Task 13 Assesses roof condition.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	65	NV	46	NV	30	40	40	40	50	NV	40	NV	44%

Task 14 Maintains roof.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	NV	35	NV	54	NV	70	60	60	60	50	NV	60	NV	56%

PIE CHART*



TITLES OF BLOCKS

Block A	Occupational Skills	Block E	Waterproofing and Damp-proofing
Block B	Roof Preparation	Block F	Roof Maintenance
Block C	Low Slope and Flat Roofing		
Block D	Shingles, Tiles and Preformed Metal Roofing		

* Average percentage of the total number of questions on an interprovincial examination, assigned to assess each block of the analysis, as derived from the collective input from workers within the occupation from all areas of Canada. Interprovincial examinations typically have from 100 to 150 multiple-choice questions.

TASK PROFILE CHART – ROOFER (2006)

BLOCKS	TASKS	SUB-TASKS					
A OCCUPATIONAL SKILLS	**1. Uses tools and equipment.**	1.01 Uses hand tools.	1.02 Uses power tools.	1.03 Uses pneumatic tools.	1.04 Uses powder actuated tools.	1.05 Uses propane-fuelled equipment.	1.06 Uses hot process equipment.
		1.07 Uses hoisting, lifting and rigging equipment.	1.08 Uses motorized equipment.	1.09 Uses personal protective equipment (PPE) and safety equipment.			
	2. Organizes work.	2.01 Uses documentation.	2.02 Communicates with others.	2.03 Assesses worksite conditions.	2.04 Estimates materials.	2.05 Maintains safe work environment.	
	3. Prepares work site.	3.01 Accesses work area.	3.02 Positions equipment and material on the ground.	3.03 Positions equipment and material on the roof.	3.04 Prepares material disposal systems.		
B ROOF PREPARATION	**4. Prepares roof for replacement.**	4.01 Removes loose debris.	4.02 Protects windows, walls, skylights and mechanical equipment.	4.03 Removes roofing and flashings.	4.04 Prepares roof substrate.	4.05 Adjusts heights of penetrations and parapets.	4.06 Installs water cut-offs, temporary seals and temporary drains.
	5. Prepares roof for new installation.	5.01 Cleans deck.	5.02 Inspects deck.	5.03 Verifies placement of roof penetrations and parapets.	5.04 Dries deck.		
C LOW SLOPE AND FLAT ROOFING	**6. Applies built-up roofing components.**	6.01 Installs gypsum board.	6.02 Primes substrate.	6.03 Applies vapour barrier and air barrier.	6.04 Installs insulation.	6.05 Installs protection board.	6.06 Installs drains, vents and roof fixtures.
		6.07 Applies ballast and protective surface.	6.08 Installs walkways.	6.09 Installs metal flashings.	6.10 Installs inverted roofing systems (Protected Membrane Roofs – PMR).		

BLOCKS	TASKS	SUB-TASKS					
	7. Applies membranes.	7.01 Relaxes membrane.	7.02 Sets membranes.	7.03 Applies membranes using hot process.	7.04 Applies membranes using torched-on method.	7.05 Applies membranes using hot-air welding.	7.06 Applies membranes using cold process.
		7.07 Applies membranes using mechanical fasteners.	7.08 Applies loose-laid membranes.	7.09 Installs membrane flashings.	7.10 Installs liquid-applied roofing membrane.		
D SHINGLES, TILES AND PREFORMED METAL ROOFING	8. Applies shingles.	8.01 Installs flashings for shingled roofs.	8.02 Installs saddles/crickets.	8.03 Installs underlayment for shingled roofs.	8.04 Determines layout of shingles.	8.05 Fastens shingles.	8.06 Tabs shingles.
		8.07 Installs vents for shingled roofs.	8.08 Cuts shingles.				
	9. Applies roof tiles.	9.01 Installs underlayment for tiled roofs.	9.02 Installs vents for tiled roofs.	9.03 Installs flashings for tiled roofs.	9.04 Installs strapping.	9.05 Installs starter strips.	9.06 Installs closure strips.
		9.07 Fastens roof tiles.	9.08 Cuts roof tiles.	9.09 Mortars ridge capping and valleys.			
	10. Applies pre-formed metal roofing.	10.01 Installs underlayment for pre-formed metal roofing.	10.02 Installs strapping for pre-formed metal roofing.	10.03 Installs closure strips for pre-formed metal roofing.	10.04 Fastens pre-formed metal roofing.	10.05 Applies flashings for pre-formed metal roofing.	10.06 Cuts sheet metal.
		10.07 Installs ridge venting.	10.08 Installs snow guards.				
E WATERPROOFING AND DAMP-PROOFING	11. Waterproofs surfaces.	11.01 Prepares surfaces.	11.02 Applies waterproofing membrane.	11.03 Applies protection board.			

ROOFER (2006)

BLOCKS	TASKS	SUB-TASKS					
	12. Damp-proofs surfaces.	12.01 Applies primer.	12.02 Applies coatings.				
F **ROOF MAINTENANCE**	**13. Assesses roof condition.**	13.01 Inspects roof.	13.02 Performs cut test.	13.03 Determines area that needs maintenance /repair.	13.04 Determines maintenance/repair required.		
	14. Maintains roof.	14.01 Maintains drains and scuppers.	14.02 Refills pitch pockets.	14.03 Replaces deteriorated caulking and sealant.	14.04 Repairs membrane defects.	14.05 Applies surfacing and ballast to bare areas.	14.06 Resecures loose metal flashings.